The Segway Human Transporter

Segway Human Transporter

- Self – Balancing
- Powered by two NiCd or NiMH batteries
- Light Weight (95lbs)
- Speed of up to 12.5mph
- Range of 11 Miles on single charge
- **Able to transport equipment**

Purpose of Tests

- Test machine as a tool for the EOD / Haz – Mat Community to use as a form of transporting personnel and equipment to scenes requiring long distances of travel

Orientation Ride

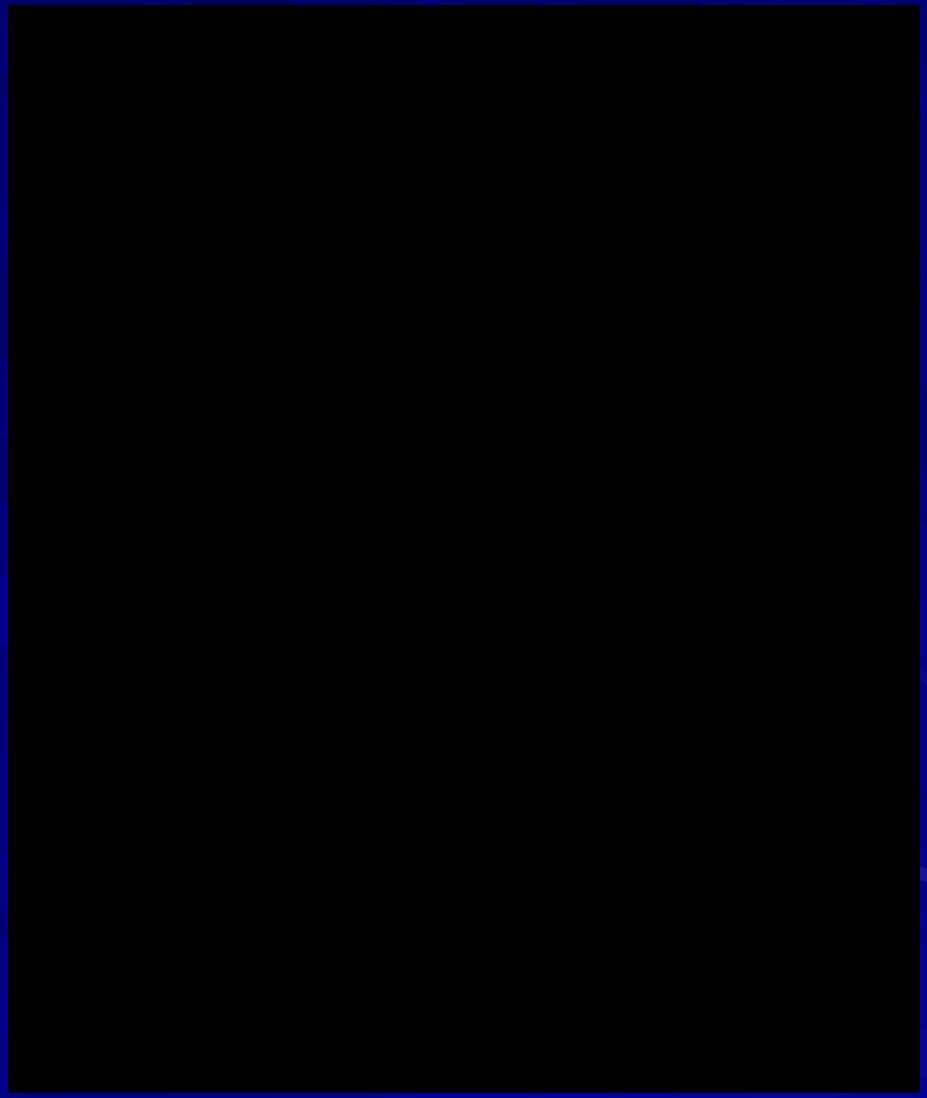
- All Techs trained & certified on machines prior to testing
- All techs given as much time on varying terrain as possible
- Hard surface, grass, dirt, mud, water, uneven terrain, & obstacles

Tests Conducted

- Performance Limits
- Range at various speeds
- Endurance under varying conditions
- Battery strength
- Weight Bearing
- Load capacity
- Machine vs Tech and other Vehicles

Orientation

- Indoor Skateboard park
- Get riders confident in machine
- **Test done with and without bomb suit on**



Performance Limits

- Distance traveled 9.5 miles
- Speed setting 5mph
- Varying terrain – hard surface, gravel, dirt, grass, concrete incline
- **Time – 2 hours non-stop**

Bomb Suit Endurance with Equipment

- Speed 12.5
- Equipment – EOD – 8, Pan disruptor with stand, 2500’ Non – L, Xray source, 2 cassettes
- Total = 383lbs
- Course of varying terrain. Wind gusts to 38mph
- TTF – 1hr 6min
- **4miles distance**

Hill Climb on foot with SCBA

- Tech w/Suit & SCBA – 352LBS
- Trailer w / Load 104lbs
- Distance 480’ Uphill
- Time 3min 38sec
- Air use start 4500lbs used – 1300lbs
- **Extremely Fatigued**

Hill Climb with SCBA cont.

- Tech on segway 385lbs
- Trailer – 104lbs with gear
- Distance – 480’
- Time – 2:30
- Air 4500lb – used 250
- **Fatigue minimal**

Large Exclusion Zone

- Comparing Tech on foot carrying gear
- On foot pulling cart with gear
- **Riding the Segway pulling cart with gear**

Take Ten

On Foot Carrying Gear

- 3300’ Zone – 6600 total
- EOD 8 w/SCBA
- Tech on foot carrying Pan w/stand
- Tech – 392lbs w/ gear
- 3900lbs air, TTT 20:55
- Air usage going 2500
- **Stopped at 9:27 air depleted 1200’ short of safe zone**

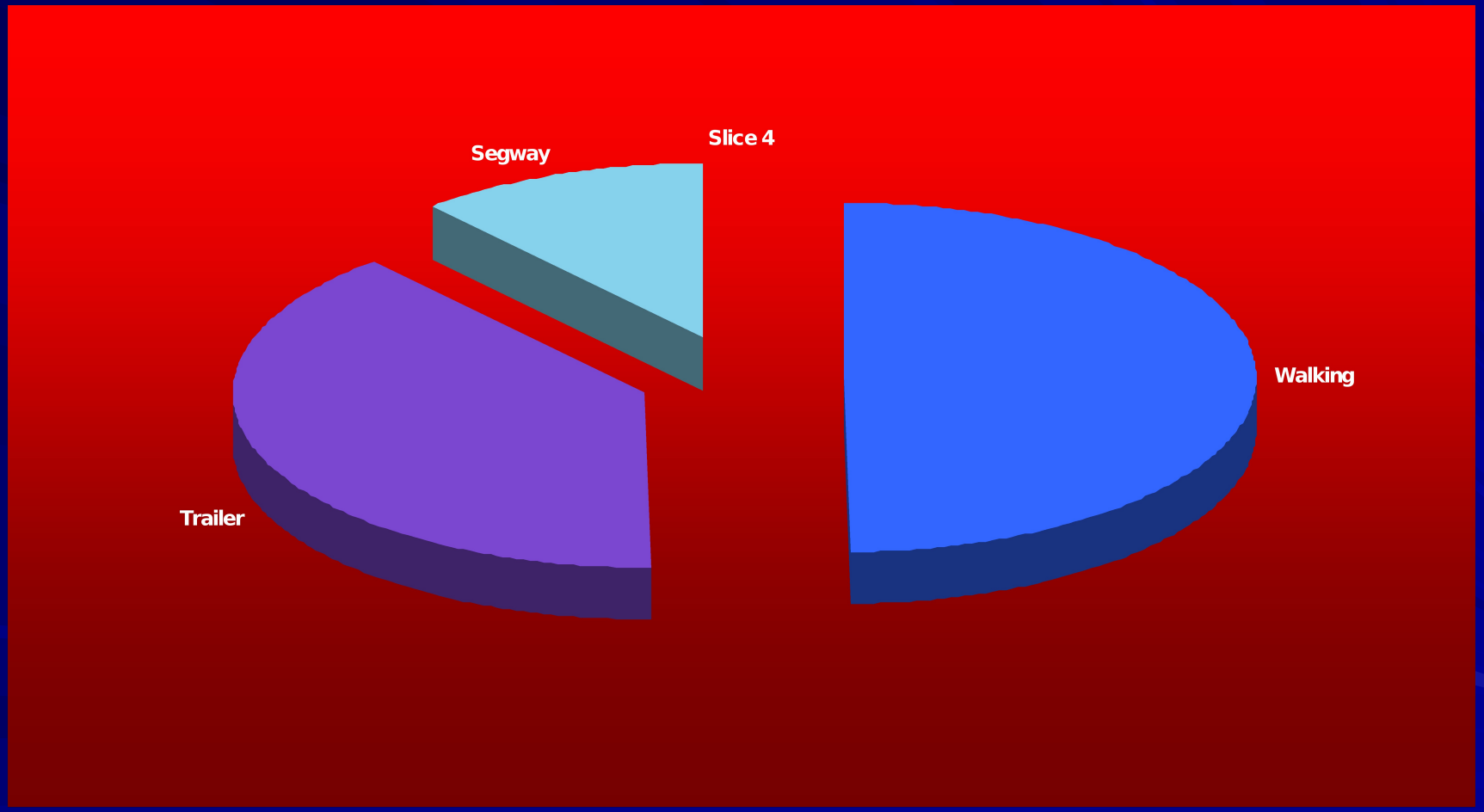
On Foot Pulling Cart w/Gear

- 3300’ Zone – 6600 total
- EOD 8 w/SCBA
- Tech on foot pulling cart
- Cart 139lbs
- Tech – 385lbs w/ suit
- 4400lbs air, TTT 16:23
- Air usage going 2100
- Return to safe zone 13:35 walking with out cart
- **Air alarm activated**

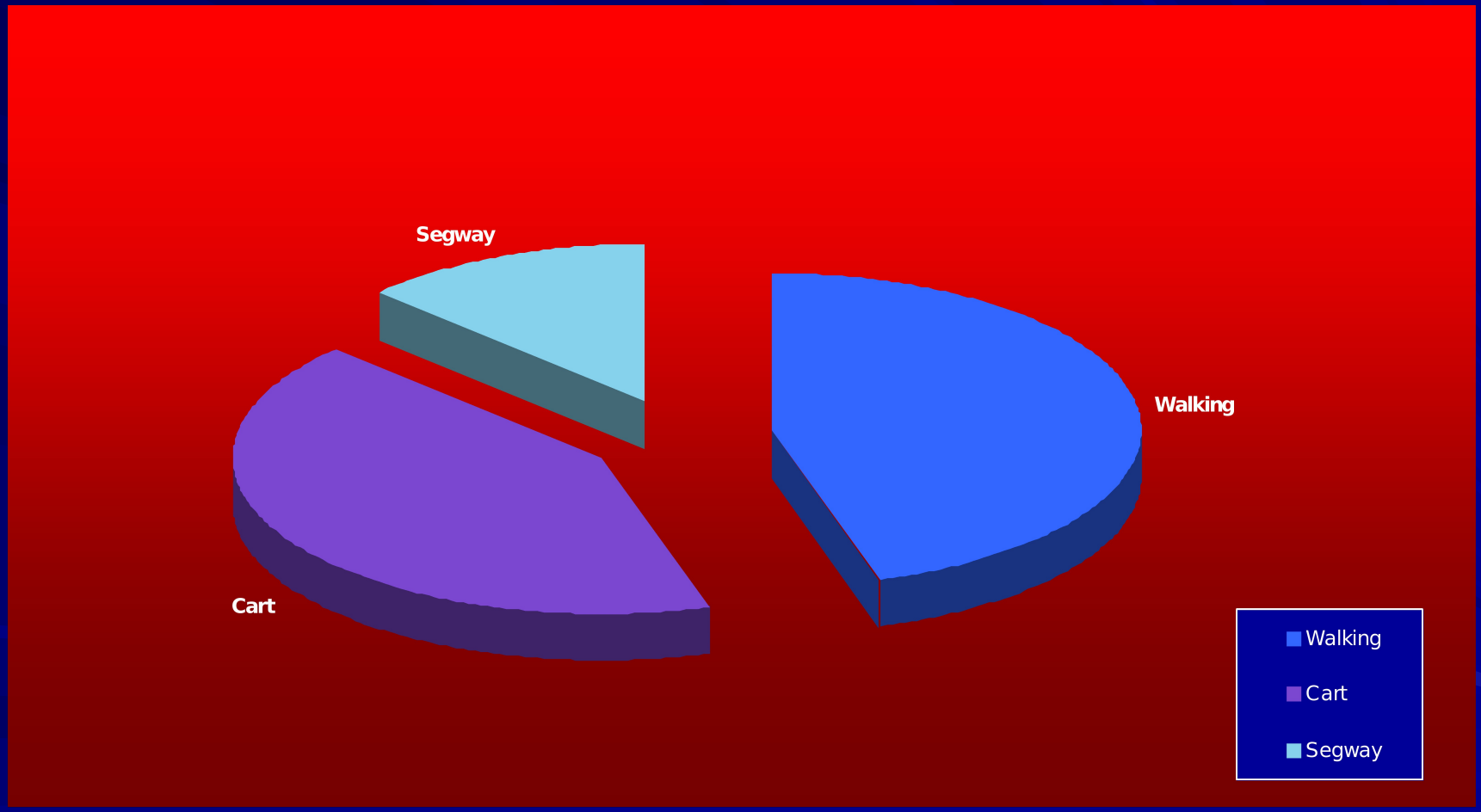
On Segway, Pulling Cart w/Gear

- 3300’ Zone – 6600 total
- EOD 8 w/SCBA
- Tech on segway w/cart
- Tech – 345lbs w/suit
- Trailer 139lbs
- 3800lbs air, TTT 4:50
- Air usage going 500lbs
- Return to safe zone 3:55 without cart
- **Overall air usage 1100lbs**

Time to Target



Total Air Usage



Level “A” Comparison

- Comparing Tech on foot carrying gear
- On foot pulling cart with gear
- **Riding the Segway pulling cart with gear**

On Foot Carrying Gear

- 3300’ Zone – 6600 total
- Kappler Level A
- Tech on foot carrying Pan w/stand
- Tech – 299lbs w/ gear
- 3600lbs air, TTT 13:28
- Air usage going 1250
- Return Time 13:16
- **Air Usage total 2300lbs**

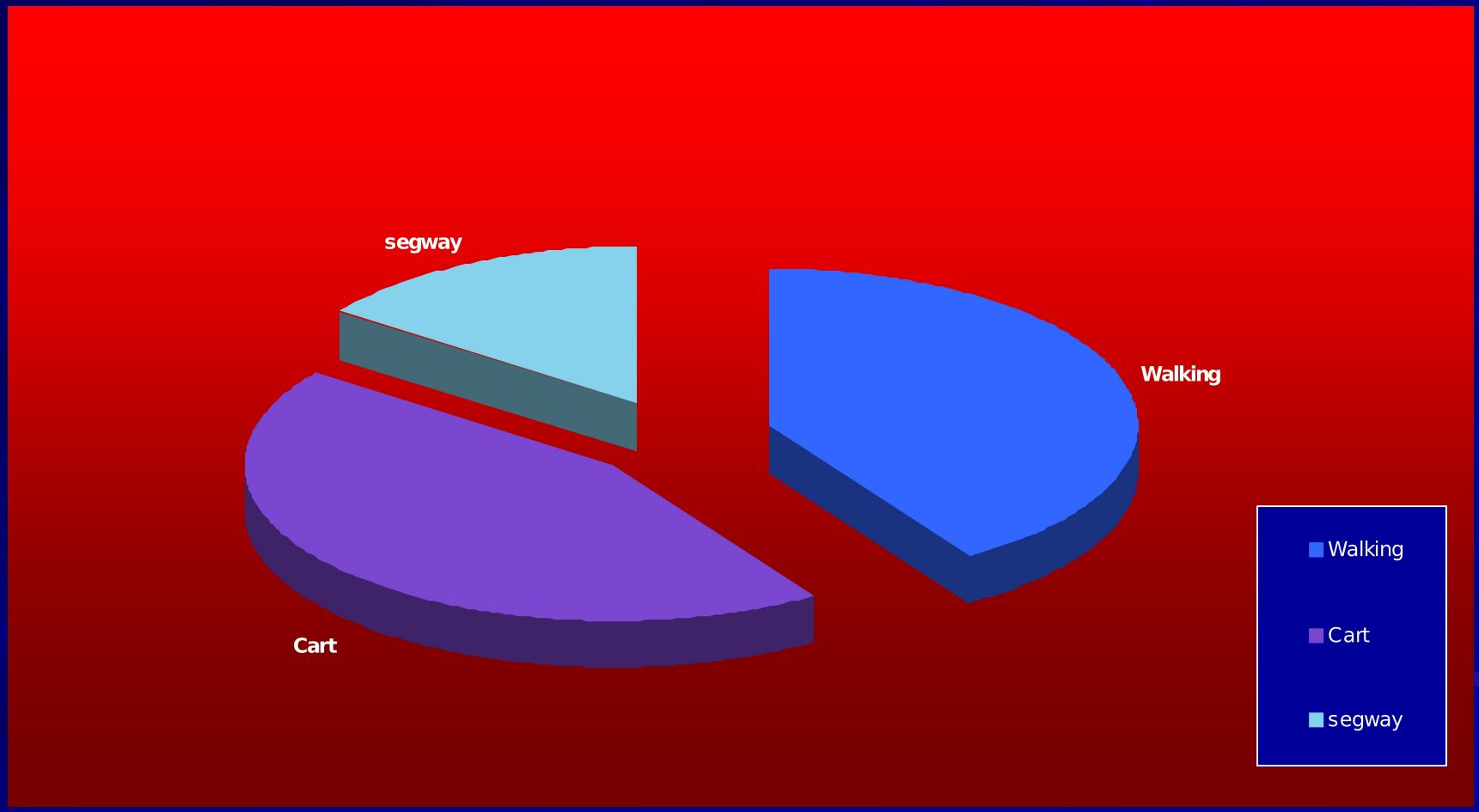
On Foot Pulling Cart

- 3300’ Zone – 6600 total
- Kappler Level A
- Tech on foot Pulling Cart
- Tech – 279lbs w/suit
- Cart w/gear 139
- 3700lbs air, TTT 14:37
- Air usage going 1200
- Return Time 13:18
- **Air Usage total 2200lbs**

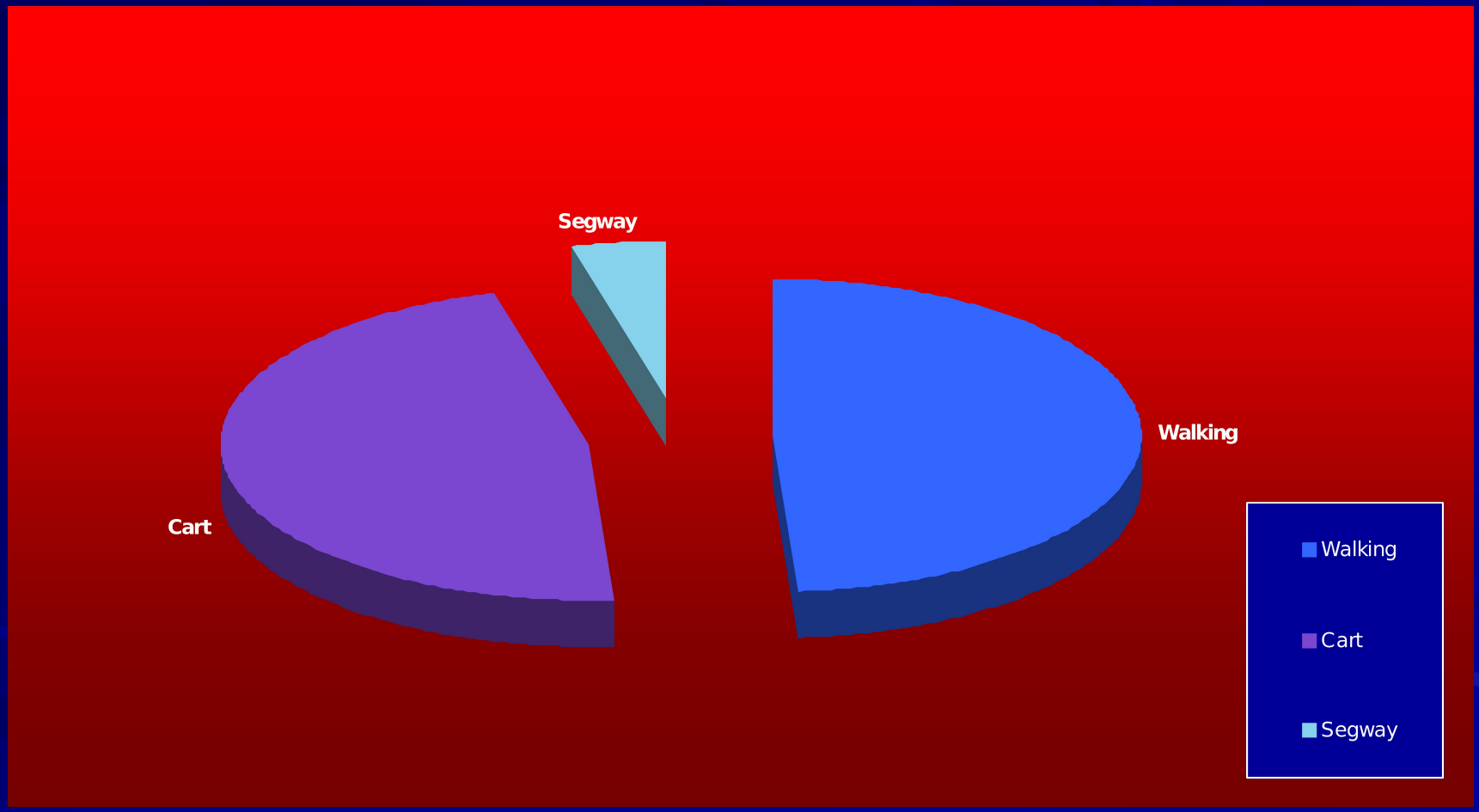
Tech on Segway

- 3300’ Zone – 6600 total
- Kappler Level A
- Tech on foot Pulling Cart
- Tech – 279lbs w/suit
- Cart w/gear 139lbs
- 3700lbs air, TTT 4:55
- Return Time 4:11
- **Air Usage total 200lbs**

Time to Target



Total Air Usage



Take Ten

Decon Capability

- Soap & Water
- Can remain in tool drop zone during operation
- Saddle bags can be removed for decon
- Unit tested was cleaned three times
- Easy to handle in level A
- **Segway in walk along mode**

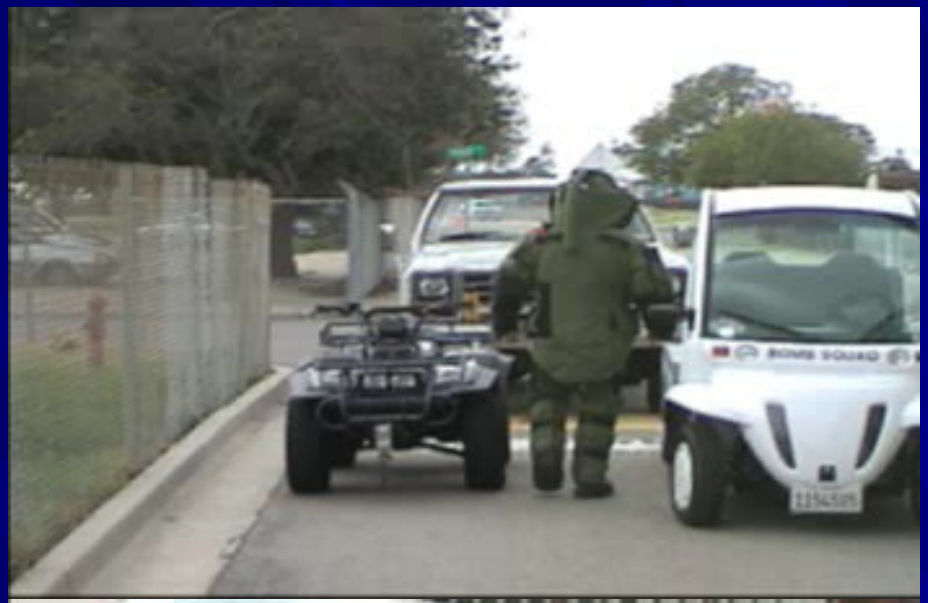
Battery Depletion

- Machine gives audible tone
- Slows down
- **Allows you 11 seconds to dismount**

Alternate Vehicles

- Machine can go into buildings
- Easily maneuvered
- **Tech does not have to climb into or over to drive vehicle**

Alternate Vehicles



Rescue with Segway & on foot

- Distance was 334’
- Level A used
- TTV – 2:00
- TOT – 3:15
- Time to return – 1:30
- Air consumed – 500lbs
- **Techs stated they could return for additional rescues.**

Use of Machine for Rescue

Rescue Cont

Local Mall / Indoors

- Tech on foot
- Total weight 314lbs
- EOD 8 Suit
- Carrying equipment in cart
- Total weight 63lbs
- Distance one way 917 feet.
- Time to target after stairs 10min
- From target back 5min
- **Tech extremely tired**

- Tech on Segway
- Total weight of tech & equipment on segway 364lbs
- Distance 917’ one way
- Time to target after stairs 4min
- From Target back 3min
- **Tech showed minimal fatigue**

Indoor Mall

Federal Grant Program

- Web Sight – www.ojp.usdoj.gov/odp/ODPApplication.txt
- Location – Apendix G, fiscal year 2003 Authorized Equipment List, paragraph 10 Allowable vehicles include
- “Two wheel personal transport vehicles for transporting fully suited bomb technicians, level A/B suited technicians to the Hot Zone.”

The Segway

Final Comments